

Abstract

A fixed frequency continuously beam-steerable leaky-wave antenna in microstrip is disclosed. The antenna's radiating strips are loaded with identical shunt-mounted variable-reactance elements, resulting in low reverse-bias-voltage requirements. By varying the reverse-bias voltage across the variable-reactance elements, the main beam of the antenna may be scanned continuously at fixed frequency. The antenna may consist of an array of radiating strips, wherein each strip includes a variable-reactance element. Changing the element's reactance value has a similar effect as changing the length of the radiating strips. This is accompanied by a change in the phase velocity of the electromagnetic wave traveling along the antenna, and results in continuous fixed-frequency main-beam steering. Alternatively, the antenna may consist of two long radiating strips separated by a small gap, wherein identical variable-reactance elements are mounted in shunt across the gap at regular intervals. A continuous change in the reactance value has a similar effect as changing continuously the width of the radiating strips. This results in a continuous change in the phase velocity of the electromagnetic wave traveling along the antenna, thereby achieving continuous fixed-frequency main-beam steering.